

WHAT IS CLAIMED IS:

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1. A manufacturing method of a plastic laminate body, the plastic laminate body having at least one plastic laminate member that is laminated on a plastic substrate, which plastic substrate is  
10 pre-processed in advance so as to have a substantially final configuration, the manufacturing method comprising:

softening the plastic laminate member when a transfer surface of a mold member, which is pre-  
15 processed in advance so as to have a desired configuration, is transferred to a surface of the plastic laminate member, so that an excessive part of the plastic laminate member is moved to an escape part which is pre-formed at the plastic substrate.

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2. The manufacturing method of a plastic  
25 laminate body as claimed in claim 1,

wherein the transfer surface of the mold member is pushed to the plastic laminate member with pressure so that the transfer surface of the mold member is transferred to the surface of the plastic  
5 laminate member.

10 3. The manufacturing method of a plastic laminate body as claimed in claim 1,  
wherein the plastic substrate has a honeycomb structure, and  
an opening part of the honeycomb structure  
15 is formed as the escape part to which the excessive part of the plastic laminate member is moved.

20 4. The manufacturing method of a plastic laminate body as claimed in claim 1,  
wherein the plastic substrate has a honeycomb structure,  
25 a thin wall part is formed at a side of a

laminate surface of the plastic laminate member, of  
an opening part of the honeycomb structure, and

the escape part, to which the excessive part  
of the plastic laminate member is moved, is formed by  
5 deforming the thin wall part according to pressure  
loaded at the time when the mold member is pushed  
with the pressure.

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5. The manufacturing method of a plastic  
laminate body as claimed in claim 4,

wherein a thickness of the thin wall part is  
15 equal to or more than 10  $\mu\text{m}$  and equal to or less than  
500  $\mu\text{m}$ .

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6. The manufacturing method of a plastic  
laminate body as claimed in claim 3,

wherein the plastic substrate having the  
honeycomb structure is formed by filling a mold with  
25 a molten resin at high pressure, wherein a plurality

of pins for forming the honeycomb structure at a cavity are provided.

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7. The manufacturing method of a plastic laminate body as claimed in claim 6,

wherein gas is given to an interface of the  
10 pins and the resin before the pins provided in the cavity of the mold are pulled out from the resin filling the cavity.

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8. The manufacturing method of a plastic laminate body as claimed in claim 1,

wherein the plastic substrate is formed by a  
20 porous body, and

a porous part of the porous body is formed as the escape part to which the excessive part of the plastic laminate member is moved.

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9. The manufacturing method of a plastic laminate body as claimed in claim 8,

wherein the plastic substrate is formed by including a foaming material when the plastic  
5 substrate is molded.

10 10. The manufacturing method of a plastic laminate body as claimed in claim 1,

wherein the plastic laminate member is softened at the time when the mold member is pushed with pressure, so that a substantial final and  
15 desired surface configuration of the plastic substrate is corrected and the plastic laminate member and the plastic substrate are bonded in one body.

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11. The manufacturing method of a plastic laminate body as claimed in claim 10,

25 wherein a structural member of the plastic

laminate member is formed by a thermoplastic member whose softening temperature T1 is lower than a softening temperature T2 of a structural member of the plastic substrate, and

5                   the plastic laminate member is heated so as to have a temperature equal to and more than the softening temperature T1 and equal to and less than the softening temperature T2 when the mold member is pushed with the pressure after the plastic laminate  
10 member is laminated on a laminate surface of the plastic substrate, so that the plastic laminate member and the plastic substrate are bonded in one body.

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12. The manufacturing method of a plastic laminate body as claimed in claim 10,

20                   wherein a structural member of the plastic laminate member is formed by an ultraviolet curing type resin and

                  an ultraviolet light is applied when the mold member is pushed with the pressure after the  
25 plastic laminate member is laminated on a laminate

surface of the plastic substrate, so that the plastic laminate member and the plastic substrate are bonded in one body.

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13. The manufacturing method of a plastic laminate body as claimed in claim 10,

10                wherein structural members of the plastic substrate and the plastic laminate member are formed under conditions that a multiplied result of a dielectric constant  $\epsilon$  and a dielectric tangent  $\delta$  of the plastic substrate is smaller than 0.01, namely  $\epsilon$   
15    $\times \tan \delta < 0.01$ , and a multiplied result of a dielectric constant  $\epsilon'$  and a dielectric tangent  $\delta'$  of the plastic laminate member is larger than 0.01, namely  $0.01 < \epsilon' \times \tan \delta'$ , and

                 the plastic laminate member is softened by a  
20 high frequency dielectric heating process, when the mold member is pushed with the pressure after the plastic laminate member is laminated on a laminate surface of the plastic substrate, so that the plastic laminate member and the plastic substrate are bonded  
25 in one body.

14. The manufacturing method of a plastic laminate body as claimed in claim 1,

wherein a plastic intermediate layer is inserted between the plastic laminate member and the plastic substrate, and the plastic intermediate layer is softened at the time when the mold member is pushed with pressure, so that a substantial final and desired surface configuration of the plastic substrate is corrected and the plastic laminate member and the plastic substrate are bonded in one body.

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15. The manufacturing method of a plastic laminate body as claimed in claim 14,

wherein a structural member of the plastic intermediate layer is formed by a thermoplastic member whose softening temperature  $T_3$  is lower than a softening temperature  $T_2$  of a structural member of the plastic substrate, and

the plastic laminate member is heated so as to have a temperature equal to or more than the softening temperature  $T_3$  and equal to or less than



the softening temperature T2 when the mold member is pushed with the pressure after the plastic intermediate layer and the plastic laminate member are laminated in turn on a laminate surface of the plastic substrate, so that the plastic laminate member and the plastic substrate are bonded in one body.

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16. The manufacturing method of a plastic laminate body as claimed in claim 14,

wherein a structural member of the plastic intermediate layer is formed by an ultraviolet curing type resin and

an ultraviolet light is applied when the mold member is pushed with the pressure after the plastic intermediate layer and the plastic laminate member are laminated in turn on a laminate surface of the plastic substrate, so that the plastic laminate member and the plastic substrate are bonded in one body.

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17. The manufacturing method of a plastic laminate body as claimed in claim 14,

wherein structural members of the plastic substrate and the plastic laminated member or the plastic intermediate layer are formed under conditions that a multiplied result of a dielectric constant  $\epsilon$  and a dielectric tangent  $\delta$  of the plastic substrate is smaller than 0.01, namely  $\epsilon \times \tan \delta < 0.01$ , and a multiplied result of a dielectric constant  $\epsilon'$  and a dielectric tangent  $\delta'$  of the plastic laminated member or the plastic intermediate layer is larger than 0.01, namely  $0.01 < \epsilon' \times \tan \delta'$ , and

the plastic laminate member or the plastic intermediate layer is selectively softened by a high frequency dielectric heating process, when the mold member is pushed with the pressure after the plastic intermediate layer and the plastic laminate member are laminated in turn on a laminate surface of the plastic substrate, so that the plastic laminate member and the plastic substrate are bonded in one body.

18. The manufacturing method of a plastic laminate body as claimed in claim 14,

wherein the plastic intermediate layer is formed by a heat curing type bonding member whose  
5 bonding temperature is lower than a softening temperature of the plastic substrate or a hot melt type bonding member, and

a heating or pressurizing process is applied so that the plastic laminate member and the plastic  
10 substrate are bonded in one body.

15 19. The manufacturing method of a plastic laminate body as claimed in claim 1,

wherein the plastic laminate member is formed by a plastic film having a thickness equal to or less than 0.5 mm.

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20. A plastic laminate body manufactured by  
25 a manufacturing method, the plastic laminate body

having at least one plastic laminate member that is laminated on a plastic substrate, which plastic substrate is pre-processed in advance so as to have a substantially final configuration, the manufacturing

5 method comprising:

softening the plastic laminate member when a transfer surface of a mold member, which is pre-processed in advance so as to have a desired configuration, is transferred to a surface of the plastic laminate member, so that an excessive part of the plastic laminate member is moved to an escape

10 part which is pre-formed at the plastic substrate,

wherein a metal reflection film is pre-formed on a surface of the plastic laminate member.

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21. A rear projection type image display apparatus, comprising:

a plastic laminate body which is used as a projecting mirror, the plastic laminate body having at least one plastic laminate member that is laminated on a plastic substrate, which plastic

25 substrate is pre-processed in advance so as to have a

substantially final configuration, the plastic laminate body being manufactured by a manufacturing method, comprising:

softening the plastic laminate member when a  
5 transfer surface of a mold member, which is pre-processed in advance so as to have a desired configuration, is transferred to a surface of the plastic laminate member, so that an excessive part of the plastic laminate member is moved to an escape  
10 part which is pre-formed at the plastic substrate,  
wherein a metal reflection film is pre-formed on a surface of the plastic laminate member.

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